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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,678	08/19/2003	Stephen G. Holmes	NVID-065/00US 140060-2133	3501
23419 7590 09/23/2008 COOLEY GODWARD KRONISH LLP ATTN: Patent Group Suite 1100 777 - 6th Street, NW Washington, DC 20001			EXAMINER SAUNDERS JR, JOSEPH	
			ART UNIT 2615	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/642,678	Applicant(s) HOLMES ET AL.	
	Examiner Joseph Saunders	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,10,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,10,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 30, 2008 has been entered. Claims 1, 2, 10, 17, and 18 are currently pending and considered below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Slezak (US 6,647,119 B1), hereinafter Slezak, in view of Sibbald (US 6,498,857 B1), hereinafter Sibbald, and Shaw et al. (US 6,016,515), hereinafter Shaw.

Claim 1: Slezak discloses a method for processing multi-channel audio data from multiple sources using a single sound card, comprising:

presenting a plurality of virtual devices (simulated sound sources) to a user with each virtual device having at least one corresponding speaker from a group of speakers located in different locations (simulated sound sources are audible indicators played through speakers 55A and 55B and therefore each has at least one corresponding speaker, speakers 54A and/or 55B, located in different locations in Figure 3), the presenting including displaying a list of the plurality of virtual devices on a graphical user interface (Figure 10);

receiving a selection from the user (via indicator 294), associating each of the plurality of audio applications (list of system events 282 from different applications) to at least one virtual device (simulated sound sources); and

using a plurality of virtual device drivers (filters) to program the single sound card to associate audio data streams of open audio applications (the different applications produce sound and therefore are audio applications) with output audio channels based on the user's selection of virtual devices (Column 4 Line 25 – Column 5 Line 16); and simultaneously outputting audio from two or more open audio applications according to a speaker assignment (Figure 3) based on the user's selection of virtual devices, wherein the user's selection associates one or more virtual devices with the audio stream of each open application (Slezak discloses in Figure 10 and Column 9 – Line 49 – Column 10 Line 14 that the user selects from a list of system events such as “e-mail notification” and Figure 10 also shows “appointment reminder” being listed. Slezak also discloses in Column 4 Lines 25 – 30 that “the operating system 35 supports operation of multiple application programs 7. As an example, the application 7 might be a scheduler

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program, an electronic mail program, a database program, or any number of other application programs commonly available". Therefore, the list of system events constitutes the claimed two or more different applications. Slezak further discloses relating a simulated sound source from a word processor to a distinct point in space while sounds from another program showing important stock information relate to sounds at different points in space so that, while the applications are simultaneously outputting audio, the user can easily ascertain or distinguish between the different programs due to the location of the simulated sound sources (Column 5 Line 55 – Column 6 Line 32)).

Slezak does not disclose the interprocess communications taking place to implement the invention and therefore does not disclose wherein the virtual device drivers write audio data streams from open applications into a system memory accessible by the single sound card and at an audio processing unit of the sound card, reading audio data and the virtual device selection from system memory; at the audio processing unit of the sound card, multiplexing audio data streams from open audio applications based on the user's selection to support simultaneously outputting audio from a plurality of open applications.

Sibbald further discloses how positioning of virtual sound sources is done for more than one signal source. In particular Figure 13 illustrates multiple signal sources S1 – S3 (Which is representative of the audio data streams generated by different applications), each being processed by a corresponding HRTF (corresponding to a virtual device driver) in order to position the virtual sound sources (corresponding to

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virtual devices), and then outputs of all of the HRTFs are multiplexed and simultaneously output. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Sibbald to the invention of Slezak, since Sibbald illustrates how to apply filters to different sources and multiplex the signals in a manner so that sounds that are intended on sounding as if coming from different positions in space do not end up sounding as if recorded from a single point source (Column 8 Lines 12 – 32).

Sibbald does not teach how to implement HRTFs in a computer system as disclosed by Slezak and therefore also does not teach virtual device drivers that write audio data streams from open applications into a system memory accessible by a sound card and at an audio processing unit of the sound card, reading audio data and the virtual device selection from system memory; at the audio processing unit of the sound card.

However Shaw discloses a system and method for processing sound in a computer system and discloses a way of applying effects to different audio streams before rendering. Shaw teaches that “filter” refers to the portion of the functionality found within a software driver, including the entire driver itself (Column 5 Lines 10 – 25). Shaw also discloses in Figure 2 that in processing audio streams, effects filters (for example the filters or HRTFs) operating in kernel mode (system memory) may have an associated effects processor or the effects filter may operate entirely in software emulating the actual hardware processor. Therefore, the effects processor writes the processed audio data stream to memory allowing for the sound card to read the

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processed audio data stream (corresponding to the positioning of the virtual devices based on the user 's selection) and later reading the information from system memory by the sound card where it is simultaneously output.

Therefore well the disclosures of Slezak and Sibbald does not explicitly provide all the necessary information to implement the system; in view of the teachings of Shaw, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the invention of Slezak and Sibbald with virtual device drivers as disclosed by Shaw performing the effects of the HRTFs disclosed by the system of Slezak and Sibbald on each different applications audio stream in order to position the sound corresponding to the different applications since the disclosure of Shaw provides for a well developed and standardized method of processing audio in a computer environment (Shaw, Column 1 Lines 9 – 16).

Slezak, Sibbald, and Shaw also do not explicitly state wherein the two or more different open audio applications are selected from the group consisting of a media player, video game software, and a video player. Slezak does disclose “scheduler program, an electronic mail program, an electronic mail program, or any number of other application programs commonly available,” Column 4 Lines 25 – 30, and the office takes official notice that media players, game software, and video players were all well known applications programs commonly available at the time of the invention. Therefore it would have been obvious to one of ordinary skill in the art to use the graphical user interface of Figure 10 of Slezak to also position audio from a media player, game

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software, or video player since this would enable the user to have sounds positioned in different locations.

Finally, Slezak, Sibbald, and Shaw disclose wherein the single sound card (single sound card 57) performs any audio mixing required for individual speakers to output audio according to the speaker assignment from the two or more different audio applications (Shaw discloses that the a hardware processor, Column 6 Lines 41 – 51, or sound card mixes audio data streams, Column 22 Lines 27 – 34, (also discussed above regarding filters and HRTFs with reference to Sibbald) according to the arbitrary user selection of open audio applications and the selection of virtual devices as taught by Slezak).

4. Claims 2, 10, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slezak, Sibbald, and Shaw, and further in view of Puryear et al. (US 2004/0064210 A1), hereinafter Puryear, and Li et al. (US 5,860,060), hereinafter Li.

Claim 2: Slezak, Sibbald, and Shaw disclose the method of claim 1, but do not disclose the invention further comprising the audio processing unit writing multiplexed audio data streams back to system memory and an audio codec interface of the sound card reading multiplexed audio data streams from system memory and routing signals in the digital domain to a plurality of audio codec DACs to generate analog output channels according to the user's selection. Puryear discloses more information relating to the implementation of a sound card and discloses that in addition to the architecture

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discloses by Shaw, with effects filters operating entirely in software or as hardware components separate from the sound card, the effects filters or virtual device drivers can also be included on the sound card and have bi-directional communication with a filter graph stored in system memory and therefore eliminate the need for additional processing components. Therefore it would have been obvious to one of ordinary skill in the art to modify the sound card of the invention of Slezak, Sibbald, and Shaw as disclosed by Puryear to have an audio processing unit of the sound card write multiplexed audio data from to system memory and read multiplexed audio data from system memory before the final step of rendering the output takes place thereby eliminating the need for separate and additional processing components. The invention of Slezak, Sibbald, Shaw, and Puryear, well disclosing rendering the signal through a digital to analog converter however do not show the details of the DAC and therefore do not disclose having a plurality of digital to analog converters for each channel.

References such as Li, however disclose that it is well known to have a separate DAC for each output channel (Figure 8). Also note that Li discloses block 530 as a D/A circuit in the singular but it does indeed contain a plurality of DACs 810 and 811. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include a plurality of DACs to audio output as disclosed by Li in the system of Slezak, Sibbald, Shaw, and Puryear, since it is well known in the art to use separate DACs after de-multiplexing the audio signal into separate channels (Li, Column 8 Lines 54 – 67).

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Claim 10: Slezak, Sibbald, Shaw, and Puryear, and Li disclose all of the limitations of claim 10 as addressed in claims 1 and 2 above, with the limitation the single sound card having an audio processing unit to read digital audio data from a memory being addressed in claim 1 above, and claim 2 above addressing the limitation of an audio codec having a plurality of digital to analog converters (DACs) to support a plurality of analog output channels. Therefore claim 10 is rejected for the reasons presented in claims 1 and 2.

Claim 17: Slezak, Sibbald, Shaw, and Puryear, and Li disclose all of the limitations of claim 17 as addressed in claims 1 and 2 above, with claim 2 above addressing the limitation of the audio codec including a plurality of digital to analog converters (DACs) with the audio codec being configured to process the plurality of output data streams and assign output data streams to digital-to-analog converters associated with output channels defined by the selection. Therefore claim 17 is rejected for the reasons presented in claims 1 and 2.

Claim 18: Slezak, Sibbald, Shaw, and Puryear, and Li disclose the system of claim 17, wherein the first processor is further configured to mix at least two of the plurality of audio data records (Shaw discloses that it is possible to mix audio data streams, Column 22 Lines 27 – 34. Also it is well known in the art that a single application may contain multiple data streams and therefore, as taught by Slezak, would be associated with the single virtual device during the selection by the user.)

Response to Arguments

5. Applicant's arguments filed July 30, 2008 with respect to claims 1, 2, 10, 17, and 18 have been fully considered but they are not persuasive. The Examiner acknowledges the Applicant's amendment to the claims, however respectfully disagrees that the prior art does not teach or suggest the elements of amended claim 1. To start the Applicant argues the references individually, and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Further, Applicant's arguments amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Applicant argues, "SLEZAK deals with providing spatial audio cues. An end user can't make an assignment of speakers in the manner of the claimed invention; additionally SLEZAK is incompatible with mixing (which would destroy the spatial location characteristics). SIBBALD deals with the reproduction of three-dimensional sound sources and also does not deal with using virtual devices to support a user selecting a speaker assignment and performing any required mixing to support two or more open applications. SHAW merely deals with a filter in a driver. In short, the combination of references fails to teach all of the elements of the claimed invention". In regards to SLEZAK, the end user can make an assignment of speakers in the manner of the **claimed** invention, since as shown in figures 3 and 10 of SLEZAK "a graphical

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user interface allows a user to adjust the location of simulated sound sources generated by computer 4,” Column 9 Lines 49 – 51, via indicator 294 and a speaker assignment is made based on the user’s selection of simulated sound sources in order to locate the simulated sound sources 102, 104, 106, 108, in space about the user 100 (see also Column 6 Lines 33 – 40 and Column 9 Line 49 – Column 10 Line 15). In regards to the allegation “additionally SLEZAK is incompatible with mixing (which would destroy the spatial location characteristics),” the Examiner again respectfully disagrees since it is the function of mixing that allows for the spatial location characteristics as evidenced by the disclosed variations in the number and position of speakers, Column 6 Lines 33 – 40, since speaker variations necessitate new speaker assignments or mixing of the audio signals. SIBBALD does deal with the reproduction of three-dimensional sound sources and has been shown in the rejection of claim 1 how the reproduction of three-dimensional sound relates to using virtual devices to support a user selecting a speaker assignment and performing any required mixing to support two or more open applications as taught by SLEZAK. Again, the relevance of SHAW was also explained in the rejection of claim 1; the rejection being based on the combination of references. Therefore, it is believed that all of Applicant’s arguments have been addressed and the rejection is maintained.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571)

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270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Suhan Ni can be reached on (571) 272-7505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./
Examiner, Art Unit 2615

/Suhan Ni/
Primary Examiner, Art Unit 2614